CLAIMS

What is claimed is:

1. A system, comprising:

a main stack;

a micro-stack coupled to the main stack;

a data flag coupled to the micro-stack;

a stack pointer;

wherein the micro-stack resides in the core of a processor and the main stack resides outside of the core of the processor;

wherein the stack pointer indicates the top of the main stack; and wherein the data flag indicates valid data in the micro-stack.

- 2. The system of claim 1, further comprising a computing engine coupled to the microstack, wherein the computing engine executes stack-based instructions.
- 3. The system of claim 2, wherein the micro-stack provides the computing engine with an operand.
- 4. The system of claim 1, wherein data are written to the micro-stack and wherein data are written to the main stack when the micro-stack is flushed.
- 5. The system of claim 1, wherein data are written to the micro-stack and wherein data are written to the main stack during an overflow condition.

102768.01/1962.05404 - 16 -

- 6. The system of claim 1, wherein the data flag indicates coherence between the main stack and the micro-stack.
- 7. The system of claim 6, wherein coherency is established by examining the data flag and updating the main stack with values from the micro-stack.
- 8. The system of claim 1, wherein the micro-stack transfers data to the main stack when the micro-stack is full.
- 9. The system of claim 1, wherein the micro-stack retrieves data from the main stack when the micro-stack is empty.
- 10. The system of claim 1, wherein the size of the micro-stack is optimized for increased performance.
- 11. A method of managing a stack-based system, comprising:

loading data on a micro-stack and a main stack, wherein the micro-stack resides in the core of a processor, and the main stack resides outside of the core of a processor;

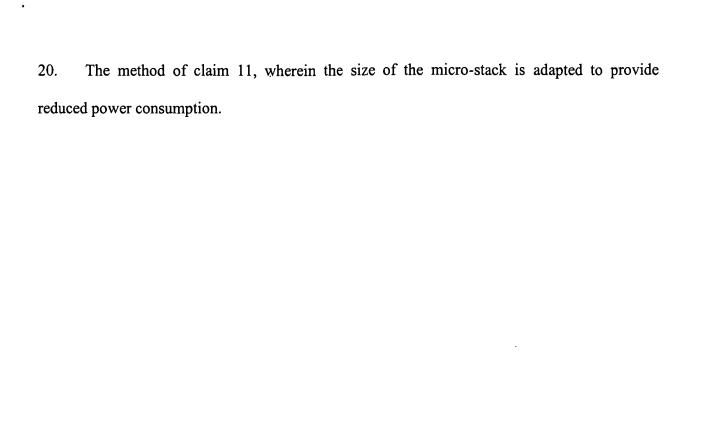
associating a data flag with each data loaded in the micro-stack;

determining the status of the data in the micro-stack; and

providing data to a compute engine from either the main stack or the micro-stack depending on the status of the data in the micro-stack.

102768.01/1962.05404 - 17 -

- 12. The method of claim 11, wherein the data flag indicates the validity of the data in the micro-stack.
- 13. The method of claim 12, wherein the data flag indicates that the data in the micro-stack is valid and the data provided to the compute engine comes from the micro-stack.
- 14. The method of claim 12, wherein the data flag indicates that the data in the micro-stack is invalid and the data provided to the compute engine comes from the main stack.
- 15. The method of claim 12, further comprising transferring data from the micro-stack to the main stack if valid data is going to be overwritten.
- 16. The method of claim 12, further comprising transferring data from the main stack to the micro-stack if requested data is invalid.
- 17. The method of claim 11, wherein the data flag includes a read pointer and a write pointer.
- 18. The method of claim 11, wherein the data flag includes valid bits.
- 19. The method of claim 11, further comprising removing data from the micro-stack and disabling the valid data flag associated with each data removed from the micro-stack.



102768.01/1962.05404 - 19 -